

## ABSTRACT OF THE DISCLOSURE

A motor control system for a brushless and sensorless DC motor for driving a compressor, pump or other application, includes a protection and fault detection circuit for detecting a locked rotor and a rotor which has stopped because of lost rotor phase lock. The motor control system also includes an off-the-shelf motor control integrated circuit having an input for disabling power outputs to the motor phase coils. The protection and fault detection circuit uses a back EMF sampling circuit coupled to the motor phase coils and momentarily disables power to the motor phase coils, via the motor control integrated circuit input, to determine if the motor rotor is rotating. The system also monitors supply voltage, supply current, temperature, and motor speed limits to detect faults and protect system components.